

NOTES ON SATURNIDÆ;

WITH A PRELIMINARY REVISION OF THE FAMILY DOWN TO THE GENUS *AUTOMERIS*, AND DESCRIPTIONS OF SOME NEW SPECIES.

By THE HON. WALTER ROTHSCHILD.

BEFORE beginning this paper I must give a few general remarks to make the scope of it clear, and also somewhat to explain my position. Here, as in my articles on *Sphingidae*, I have based my work on Mr. Kirby's *Catalogue of Heterocera*, which I employ for the sake of convenience to arrange my collection by.

Many of my readers will, no doubt, be much surprised to find such a difference between the style, extent of research, and general drift of this article, and one I am about to publish on the Old World Papilios (exclusive of Africa); in explanation of this I must state that the present paper is intended to indicate merely a few of the most obvious errors and new facts which struck me on arranging my collection, while the article on Papilios is one of three or four papers which are intended to pave the way for a final entire and critical revision of the families *Papilioninae*, *Sphingidae*, and *Saturnidae*, which are the families of Lepidoptera I take most interest in, and of which I believe I have an almost, if not quite, unrivalled collection.

In the course of the work connected with this paper, I carefully studied Mr. Hampson's *Moths of India*; and, although I consider it an admirable work, which supplied a great want, I cannot agree with certain of its author's views. The chief of those I object to is that he considers differences of structure, if very slight, as only worthy of marking sections of a genus; but I consider them of generic value, because, if a genus is small, it is much more easy to find the affinities of a species; and so if there are any permanent characters, however slight, I prefer to separate the insects exhibiting them into a genus rather than a section. It is much more convenient to call an insect at once *Caligula simla* than *Saturnia* (Section II.) *simla*.

Where not otherwise stated the types of the new species are in the Tring Museum.

COSCINOCERA.

In this genus *C. omphale* Butl. sinks as a synonym of *C. hercules* (Misk.), for I have specimens from Queensland and New Guinea which agree perfectly with the type of *C. omphale* from New Ireland.

I have a specimen, however, which is said to be from German New Guinea, which has the ocelli in all four wings much smaller and nearer the base of the wings; this I propose to call *Coscinocera hercules* (Misk.) ab. *butleri* ab. nov.

RHESCYNTIS.

Here I only have to remark that I have a fine female of *Rh. mortii* (Perty) from British Guiana, while the species was originally described from South Brazil. This shows that *Rh. mortii* (Perty) has almost the same range as *Rh. hippodamia* (Cram.), of which latter, I may add, I have specimens from Central America, British Guiana, Dutch Guiana, and Brazil.

ATTACUS.

In this genus I consider *A. lorquini* Feld. a good species instead of a subspecies of *A. atlas* (Linn.). I have three new species to describe :—

***Attacus dohertyi* sp. nov.**

This species, of which I have three *mules*, is somewhat intermediate between *A. edwardsi* White and *A. crameri* Feld.

Forewings : ground colour nearest to that of *A. crameri* Feld., but differs by its more rosy tinge and the much larger vitreous spots in the middle of each wing. Costa and base of the wing deep red, densely powdered with blue scales.

The transverse band beyond the vitreous spots consists, as in most members of the genus, of four contiguous bands ; the inner one is black and very deeply and distinctly dentated, the second is white, the third is bright maroon red, and the outer and broadest one is deep brown, densely powdered with blue scales.

Outer margin half an inch wide, and clay brown, enclosing a black zigzag line, changing to bright rose red at the apical third.

Hindwings similar, but inside the submarginal line is a row of large bright maroon red patches.

Head, thorax, and abdomen rosy brown : *antennae* very large, and with the pectinations very long.

Underside similar in marking to the upper, but ground colour pale clay brown washed with grey, and the row of maroon spots within the submarginal line is present in both pairs of wings.

Expanse : 9 inches = 230 mm.

Hab. Timor (*type*) and Flores.

***Attacus aurantiacus* sp. nov.**

Forewings rosy brownish orange, the transverse band composed of three contiguous bars only, the inner one chocolate red, the second one white, and the outer one twice as broad as in *A. atlas* (Linn.) and bright rose pink, powdered with blue scales on the outer edge. Costa blue grey.

Hindwings similar.

Vitreous patches in all four wings large and much nearer the base of the wings than in any other Oriental species of *Attacus*. Outer margin of all the wings half as wide as in *A. dohertyi* sp. nov., and much darker : submarginal line red, and the patches inside it rosy pink.

Expanse : 11 inches = 280 mm.

Hab. North West New Guinea (2 ♂, 2 ♀).

***Attacus staudingeri* sp. nov.**

This very remarkable species is nearest to *A. edwardsi* White, but in shape reminds one forcibly of *Drepanoptera albida* (Druce).

Forewings narrow and very strongly curved, almost semicircular or sickle shaped. Ground colour rich plum purple, washed with an olivaceous tinge. About an inch from the base there is a rectangular elbowed transverse white band, and the outer edge of the large triangular vitreous spot is deeply bordered with olive yellow. The transverse band beyond the vitreous patch is strongly angulated and dentated, and consists of three contiguous bands—first black, second white, and the outer one

is very ragged and irregular, three-quarters of an inch wide and rosy mauve in colour.

Hindwings similar, but the submarginal line is double, very zigzag, and jagged. Body smoky purple, with a white band at the base of the abdomen.

Underside similar in colour and marking to the upperside.

Expanse : 8 inches = 204 mm.

Hab. North West Java. (♂, in Coll. Staudinger.)

PHILOSAMIA.

In this genus matters are doubly complicated, for not only is there a large synonymy, but Mr. Hampson in trying to set matters right has assigned most of the synonyms and aberrational names to the wrong species. Also he is an entomologist who up to now has not allowed subspecies and aberrations to bear names, which has the grave result, that if the names applied to any such subspecies or aberrations are simply recorded as synonyms, everybody who gets one of these aberrant specimens re-describes it as a new species, while if it is recorded as subspecies (α) or aberration (β), it at once forces the would-be describer to look it up. *P. guerini* (Moore) is only an aberration of *P. lunula* (Walk.); *P. obscura* (Butl.) is also only an aberration of *P. lunula* (Walk.); while *P. lunula* (Walk.) is an older name than *P. ricini* (Hutt.), and therefore must stand for the species. *P. iole* (Westw.) is simply a monstrosity of *P. walkeri* (Feld.), and Mr. Hampson most unreasonably unites it to *P. ricini*, which, as stated above, is a synonym of *P. lunula* (Walk.). I have two specimens of *P. iole* (Westw.) which I bred myself from eggs laid in the Zoological Gardens by a typical male of *P. walkeri* (Feld.), which is *P. cynthia* (auct.) (*nec* Drury). *P. pryeri* (Butl.) is a good local race, and must stand as a subspecies, while *P. cynthia* (Drury) is an insular and southern form which is quite constant and must rank as a species.

The Asiatic species of *Philosamia*, therefore, work out as follows :—

1. *Philosamia cynthia* (Drury).
2. *Ph. lunula* (Walk.)
 - ab. *obscura* (Butl.).
 - ab. *guerini* (Moore).
3. *Ph. walkeri* (Feld.) = *cynthia* auct. (*nec* Drury).
 - ab. *iole* (Westw.).
 - subsp. *pryeri* (Butl.).

The African species included by Kirby in *Philosamia* I now separate into the genus *Drepanoptera*.

DREPANOPTERA gen. nov.

Differs from *Philosamia* by the *males* having the forewings much more falcate, elongated, and narrower, and the *females* having all four wings much rounder and blunter. This new genus differs also from *Philosamia* in having the sexes unlike each other, while in the latter they are identical.

The genus stands as follows :—

1. *Drepanoptera albida* (Druce).
2. *D. antinorii* (Oberth.).
3. *D. vacuna* (Westw.)
 - ab. *ploetzi* (Plötz).
 - ab. *getula* (Maass. & Weym.).

EPIPHORA

Here I have nothing to say.

SAMIA.

Here I only have to remark that there are hybrids raised both ways between all the species in my collection.

CALLOSAMIA AND TELEA.

These genera call for no remarks.

BUNAEA.

I have not seen several of the species in this genus, but I have a lot to correct. *B. plumicornis* Butl., *B. aslauga* Kirby, *B. auricolor* (Mab.), *B. fuscicolor* (Mab.), and *B. diospyri* (Mab.) are all aberrations of one species. I have several intermediate specimens.

B. nyctalops (Wallengr.) is a synonym of *B. caffraria* (Stoll.); *B. buchholzi* Plötz is a synonym of *B. eblis* Streek.; *B. schöstedti* Auriv. is the male of *B. alinda* (Drury); *B. thomsoni* Kirby and *B. laestrygon* (Mab.) are identical with *B. phaedusa* (Drury).

I have one new species to describe :—

***Bunaea tricolor* sp. nov.**

Forewings deep blackish grey, crossed about an inch from the outer margin by a white transverse band, and at the apex of the cell there is a small vitreous spot. *Costa* white.

Hindwings deep blackish grey. In the centre of the wing is an ocellus with a tiny vitreous centre; round this is a broad ring of bright orange red, followed by a black and then by an outside white ring. Beyond the ocellus is a broad white transverse band, through the centre of which runs a narrow black line.

Head, thorax, and abdomen chocolate rufous.

Underside brownish grey.

Expanse : 5½ inches = 140 mm.

Hab. Bogos, Abyssinia.

Bunaea aetes (Westw.) is not a *Bunaea* at all, but a true *Gonimbrasia*, as is also *B. erythrotis* (Karsch). *B. arnobia* (Westw.) and its ab. *discrepans* (Butl.) are not *Copaxas*, as stated with a (?) by Mr. Kirby, but belong to a genus near to *Bunaea*, described by Karsch, and stand thus :—

1. *Cremastoechrysallis arnobia* (Westw.).
ab. *discrepans* (Butl.).

The genus *Bunaea* itself works out as follows :—

1. *Bunaea auricolor* (Mab.).
ab. *fuscicolor* (Mab.).
ab. *diospyri* (Mab.).
ab. *aslauga* Kirby.
ab. *plumicornis* Butl.
2. *B. alvinoe* (Stoll.).

3. *B. caffraria* (Stoll.),
 ab. *punctigera* (Wallengr.),
 ab. *angasana* (Westw.).
4. *B. alinda* (Drury).
5. *B. tyrrhena* (Westw.),
 subsp. *catochra* Karsch.
6. *B. irius* (Fabr.),
 (syn. : *B. epithyrhena* Maass. & Weym.).
7. *B. melinde* Maass. & Weym.
8. *B. jamesoni* Druce,
 (syn. : *B. staudingeri* Auriv.).
9. *B. eblis* Streck.
10. *B. senegalensis* (Oliv.)?
11. *B. phaedusa* (Drury).
12. *B. saturnus* (Fabr.).
13. *B. cervina* (Westw.)?
14. *B. tricolor* sp. nov.
15. *B. natalensis* Auriv.
16. *A. cleopatra* Auriv.

GONIMBRASIA.

Here *G. rhodophila* (Walk.) is the same as *G. intermiscens* (Walk.) ; so *intermiscens* sinks into a synonym.

IMBRASIA.

Mr. Kirby enumerates seven species ; of these only two stand, namely *I. epimethea* (Drury) and *deyrollei* (Thoms.), and the genus works out thus :—

1. *Imbrasia epimethea* (Drury).
 ♀ = *obscura* (Butl.).
 ab. *hebe* (Maass. & Weym.).
 ab. *doreas* (Walk.).
 ab. *erameri* Kirby.
 ab. *mopsa* (Walk.).
2. *I. deyrollei* (Thoms.).

I have eighteen specimens of *I. epimethea* (Drury), and they show every gradation between the five named aberrations.

SAGANA.

I have no notes to give on this genus.

CRICULA.

Here *C. drepanoides* Moore and *zuleika* (Westw.) are aberrations of *C. trifenestrata* (Helf.), which appears thus :—

1. *Cricula trifenestrata* (Helf.).
 ab. *drepanoides* Moore.
 ab. *zuleika* (Westw.).
 subsp. *burmana* Swinhoe.

COPAXA.

C. arnobia (Westw.) and its aberration *discrepans* (Butl.) are not *Copaxas*, but form the genus *Cremastochrysalis* Karsch.

I have three new species and one subspecies to describe :—

Copaxa syntheratoides sp. nov.

This species has a strong superficial resemblance to the Oriental genus *Syntherata*.

Forewings: ground colour golden yellow, flushed and patched with rufous orange, strongest round the ocelli and beyond the outer transverse band. Basal half of costa blackish brown, apical half yellow. About half an inch from the base the wings are crossed by an irregular red transverse line from the costa to the inner margin. From the red subapical spot to the inner margin the wings are crossed obliquely by a heavy dark reddish brown band. At the apex of the cell is a small oblong ocellus with a vitreous centre and a black outer ring. Running up for a short way into the wing from the centre of the inner margin and between the two transverse bands is an indistinct red line.

Hindwings similar, but the transverse band outside the ocellus is replaced by a row of seven brown dots.

Head, thorax, and abdomen yellow.

Underside similar, but duller, and without the brown transverse bars, while through the centre of the four wings runs a transverse band of dull orange.

Expanse: $5\frac{1}{4}$ inches = 133 mm.

Hab. Volcano of Chiriqui, Costa Rica. (In Coll. Standinger.)

Copaxa multifenestrata rufotincta subsp. nov.

Ground colour of basal two-thirds of both fore and hind wings orange rufous, outer third deep brown; markings as in *C. multifenestrata* (Herr.-Schäffl.).

Expanse: 5 inches = 127 mm.

Hab. Panama.

Copaxa cineracea sp. nov.

Forewings uniform dark ashy grey, with a small vitreous spot at the apex of the cell.

Hindwings similar, but with an indistinct darker transverse line one-third from the base.

Underside identical with upper.

Body and head ashy grey.

Antennae straw yellow.

Expanse: 5 inches = 127 mm.

Hab. ?

Copaxa trimacula sp. nov.

Forewings clay brown, flushed with pale reddish in one of my two specimens. Beyond the cell are three round vitreous spots, and one-third from the base is an indistinct zigzag transverse line. From the apex of the cell to the centre of the inner margin runs obliquely a dark transverse line.

Hindwings similar in colour, but with a single vitreous spot only, just beyond which is a transverse row of small round dots, and there is also a transverse line one-third from the base of the wings.

Underside, head, and body pale brown.

Expanse : $5\frac{1}{2}$ inches = 136 mm.

Hab. Central America.

TAGAROPSIS.

Here there is nothing to say, except to record *T. falcata* Auriv. and *T. dentifera conspersa* Auriv.

ORTHOAGONOPTILUM Karsch.

This genus contains three species : *O. odietum* Karsch, *monochromum* Karsch, and *kunzei* (Dew.).

SYNTHERATA.

Here *S. weymeri* Maass., *S. janetta* (White), *S. melvillia* (Westw.), and *S. disjuncta* (Walk.) are all the same species, as I have every intermediate; so the genus works out as follows :—

1. *Syntherata janetta* (White).
 - ab. *melvillia* (Westw.).
 - ab. *disjuncta* (Walk.).
 - ab. *weymeri* Maass..
2. *S. godeffroyi* Butl.
3. *S. loepoides* (Butl.).

Of *Syntherata janetta* ab. *disjuncta* I have had two specimens lent me by Dr. Staudinger, of which the *male* is from Amboyna and the *female* from German New Guinea, and I have just had three *females* and one *male* from Simbang, German New Guinea.

I have of *S. loepoides* (Butl.) two specimens from Java, and I had one from Mt. Kina Balu, N. Borneo, lent me by Dr. Staudinger.

ANTHERAEA.

I separate the African species included in this genus by Mr. Kirby under the generic name *Nudaurelia*.

NUDAURELIA gen. nov.

Differs from *Antheraea* in having long cylindrical larvae with strong spines arranged in rows and often branched, and naked pupae, the larvae going into the ground instead of spinning a cocoon. The perfect insect differs principally in the legs : in *Antheraea* the five joints of the feet are fully developed and flattened laterally, the second, third, and fourth joints being together *longer* than the first ; in *Nudaurelia*, on the other hand, they are cylindrical and only fully developed in the *male*, the fourth joint in the *female* being minute and entirely atrophied, and in *both sexes* the second, third, and fourth joints are together *shorter* than the first joint and in some species barely half as long. The abdomen also in *Nudaurelia* differs from *Antheraea* in that in the *male* it reaches the anal angle of the hindwings and in the *female* beyond it, while in *Antheraea* in the *male* it reaches half-way to the anal angle and in the *female* two-thirds.

In *N. arata* (Westw.) there occurs a form in Natal which has the ground colour reddish chestnut instead of yellow; this I propose to call ab. *fusca* ab. nov. Sierra Leone specimens of the *female* are much brighter and the pattern more distinct than Natal specimens, while Sierra Leone *males* are paler in colour and the markings more restricted.

Now I come to a much vexed enigma which Mr. Kirby has not solved rightly. Professor Aurivillius explained the matter to us personally when he was at Tring a short time ago. In the Museum at Upsala are a number of Linnean types, among which is the specimen from which Linné drew up his DESCRIPTION of *Bombyx paphia*. Now Professor Aurivillius told me that, from the manuscripts in possession of the Museum, it is quite clear that he first drew up his diagnosis from this specimen, and then afterwards quoted the two figures mentioned by him, believing them to be identical with his species. Therefore it will be seen that the specimen at Upsala is the true TYPE of the species, and as it is identical with *Antheraea rumphi* Feld. from Amboyna it is certainly not the African *Nudaurelia* Mr. Kirby has identified with the Linnean description, and which, therefore, must stand as *Nudaurelia dione* (Fabr.).

N. anthina (Karsch) is only a subspecies of *N. wahlbergi* (Boisd.), as is also a form from Acera which I propose to call subsp. *flavescens* subsp. nov., on account of its pale yellow colour.

N. huebneri (Kirby), named after Huebner's drawing, must sink as a synonym of *N. belina* (Westw.), as I have every intermediate, and moreover the drawing was clearly done from a faded specimen.

I have two new species to describe :—

***Nudaurelia aurantiaca* sp. nov.**

Forewings deep ruddy orange; about one-third from the base they are crossed transversely by a double zigzag line from the costa to the inner margin: on the inner side this double band is black, and on the outer white. At the apex of the cell there is an ocellus, surrounded by a black outer ring, centre vitreous with a broad fuscous inner ring. A little beyond the ocellus the wings are crossed by a second double transverse band from the costa to the inner margin, but this band is white on the *inner* side and black on the outer.

Hindwings similar to the forewings, but without the transverse band at the base. Ocellus very large, and outside the black ring are three more—first a crimson one, then a pink ring, and lastly an outside crimson one.

Thorax and *abdomen* deep rufous chestnut.

Underside similar to upperside, but the basal transverse band is absent in both fore and hind wings.

Expanse: 5 inches = 127 mm.

Hab. Songive Valley, Lake Nyassa.

***Nudaurelia felderi* sp. nov.**

Wings very similar to red varieties of *N. belina* (Westw.), but without the ocellus on the forewings, there being only a small square vitreous spot. Another difference is the very broad white border to the ocelli of the hindwings.

Expanse: 5½ inches = 140 mm.

Hab. Bogos, Abyssinia.

Of *N. menippe* (Westw.) I have a series from Taveta, Central East Africa, which are smoky brown all over instead of dull crimson; this form I propose to name *N. menippe fumosa* subsp. nov.

At present, therefore, the genus *Nudaurelia* stands as follows:—

1. *Nudaurelia dolabella* (Druce).
2. *N. arabella* (Auriv.).
3. *N. arata* (Westw.).
ab. *fusca* ab. nov.
4. *N. emini* (Butl.).
5. *N. dido* (Maass. & Weym.).
6. *N. bersilia* (Westw.).
7. *N. dione* Fabr.
(syn. : *N. paphia* Kirby, *nee* Linn.).
8. *N. wahlbergi* (Boisd.).
subsp. *anthina* (Karsch).
subsp. *flavescens* subsp. nov.
9. *N. anna* (Maass. & Weym.).
10. *N. said* (Oberth.).
11. *N. zaidachi* (Dew.).
12. *N. oubiv* (Guér.).
13. *N. belina* (Westw.).
14. *N. menippe* (Westw.).
subsp. *fumosa* subsp. nov.
15. *N. macrophthalmus* (Kirby).
16. *N. licharbas* (Maass. & Weym.).
17. *N. barcus* (Maass. & Weym.).
18. *N. zambesina* (Walk.).
19. *N. tyrrhea* (Cram.).
20. *N. suraka* (Boisd.).
21. *N. hochneli* (Rogenh.).
22. *N. aurantiaca* sp. nov.
23. *N. felderi* sp. nov.

ANTHERAEA.

Here *Antheraea ramphi* Feld. sinks as a synonym of *A. paphia* (Linn.). Linné's type is in the Museum at Upsala; it is a *male* from Amboyna, and agrees with *ramphi* Feld., which is based on a *female* specimen. The synonymy of this species is therefore as follows:—

Antheraea paphia (Linn.).

♂. *jana* (Stoll.).

♀. *ramphi* Feld.

A. roylei Moore is only a subspecies of *A. pernyi* (Guér.), and *A. confuci* and *sherrillei* of Moore are mere aberrations of *A. roylei*, every intermediate being known. *A. cingalesa* Moore is only an aberration of *A. nylitta* (Drury). *A. sergestus* (Westw.), *A. morosa* Butl., *A. hazina* Butl., *A. fentoni* Butl., and *A. calida* Butl. are all colour varieties of *A. yamamai* (Guér.), but I cannot do otherwise than treat them as synonyms only of *A. yamamai*, because in this species no two specimens are exactly alike, either in colour or marking, and if these names were allowed to stand as aberrations we should have to name every specimen.

Antheraea fraterna Moore is an aberration of *A. frithi*.

Caligula helferi (Moore), *C. assamensis* (Helf.), and *C. perrotteti* (Guér.) are not *Caligulas* at all, but are true *Antheraeas*, so that the genus stands thus :—

1. *Antheraea assamensis* (Helf.).
2. *A. helferi* Moore.
3. *A. perrotteti* (Guér.).
4. *A. paphia* (Linn.).
5. *A. andamana* Moore.
6. *A. mylitta* (Drury).
ab. *cingalesa* Moore.
7. *A. semperi* Feld.
8. *A. pernyi* (Guér.).
subsp. *roylei* Moore.
ab. *confucii* Moore.
ab. *shervillei* Moore.
9. *A. larissa* (Westw.).
10. *A. frithi* Moore.
ab. *fraterna* Moore.
11. *A. billitonensis* Moore.
12. *A. yamamai* (Guér.).
13. *A. sciron* (Westw.).
14. *A. pristina* Walk.

CARTHAEA, BATHYPHLEBIA, AND OPODIPHTERA.

About these genera there is nothing to say.

CALIGULA.

Here *Caligula japonica* Butl. must be reduced to a subspecies of *C. simla* (Westw.), as I have several intermediate specimens both from Sikkim and Japan.

The genus stands thus :—

1. *Caligula simla* (Westw.).
subsp. *japonica* Butl.
2. *C. cachara* Moore.
3. *C. helena* (White).
4. *C. intermedia* (Luc.).
5. *C. eucalypti* (Scott).

NEORIS.

This genus is a composite one, two of the three species being true *Saturnias*, so that there only remains one species, thus :—

Neoris shadulla Moore (type of genus).

Of the other two, *Neoris huttoni* Moore is a synonym of *Saturnia stoliczkanii* Feld. and *Neoris jousi* (Butl.) must stand now as *Saturnia jousi* (Butl.).

RINACA.

Here *Rinaca extensa* Butl. is the same as *R. thibeta* (Westw.), so the genus stands thus :—

1. *Rinaca zuleika* (Hope).
2. *R. thibeta* (Westw.).

RHODIA.

Here *Rhodia diana* (Oberth.) must be reduced to a subspecies only of *R. fugax* Butl., as intermediates occur. *R. thespis* (Leech), *R. royi* (Elwes), and *R. olivacea* (Oberth.) are true *Salassa*, so that the genus is composed as follows :—

1. *Rhodia newara* Moore.
2. *Rh. fugax* Butl.
 subsp. *diana* (Oberth.).
3. *Rh. jankowskii* (Oberth.).
4. *Rh. davidi* (Oberth.).

LOEPA.

Here *L. sikkima* Moore is merely an aberration of *L. katinka* (Westw.), and must sink as a synonym, as in the same batch of eggs specimens hatch out of every shade. *Saturnia oberthüri* Leech is a true *Loepa* ; its *female* is described under the name of *Loepa doynini* in the Report of the Chambre de Commerce de Lyon (1894). The genus is as follows :—

1. *Loepa katinka* (Westw.).
2. *L. miranda* Moore.
3. *L. oberthüri* (Leech).

SALASSA.

Here *S. thespis* (Leech), *olivacea* (Oberth.), and *royi* (Elwes), which Mr. Kirby, for some quite mysterious reason, placed in the genus *Rhodia*, all belong to this genus. *S. megastica* Swinh. is only a variety of *S. thespis* (Leech), so the genus works out as follows :—

1. *Salassa lola* (Westw.).
2. *S. thespis* (Leech).
 ab. *megastica* Swinh.
3. *S. olivacea* (Oberth.).
4. *S. royi* (Elwes).

GYXANISA.

In this genus *G. isis* (Westw.) is to my mind only a colour aberration of *G. maia* (Klug).

I possess a *female* of *Gynanisa ethra* Westw. from Manfé, W. Africa, so at length the locality of this fine species is cleared up.

I have one new species to describe :—

***Gynanisa westwoodi* sp. nov.**

Differs from *G. maia* (Klug) by its extremely falcated forewings and dingy colour.

Forewings much narrowed towards the apex and strongly curved or sickle shaped, brownish buff powdered with black and grey scales on the basal half; the transverse line nearest the base is elbowed, but not zigzag as in *maia* (Klug). Ocellus diamond-shaped, thus \blacklozenge , with a small vitreous dot near the apex, while in *maia* (Klug) the ocellus is ovate and with a large vitreous centre. The second transverse black band crossing the forewings is contiguous to the ocellus and quite straight, while in *maia* (Klug) it is zigzag and well away and separate from the ocellus. The third transverse band is reduced to an almost obliterated hairlike

black line, while in *maia* (Klug) it is a well-developed double black and white band. Beyond this third transverse band in *westwoodi* there is a very broad pale buff band three-quarters of an inch wide, while in *maia* (Klug) it is barely half so wide and orange buff powdered with black and having a broad chocolate bar running down the centre. Outer margin drab grey instead of black brown as in *G. maia* (Klug).

Hindwings: these show the same differences from those of *G. maia* (Klug) as do the forewings, while the pupil of the ocellus is black and twice as large as in *G. maia* (Klug).

Expanse : 6 inches = 153 mm.

Hab. Taveta, East Africa.

The synopsis of the genus is as follows :—

1. *Gynanisa maia* (Klug).
ab. *isis* (Westw.).
2. *G. ethra* (Westw.).
3. *G. westwoodi* sp. nov.

CERANZIA.

I have nothing to remark on this genus.

CIRINA.

The type of *C. cana* Feld., now in my collection, is nothing more than a small *male* of *C. firda* (Westw.) much rubbed and faded, so that the genus contains only the following single species :—

1. *Cirina firda* (Westw.).

UROTA, TERATOPTERIS, AND DRACONAPTERIS.

I cannot find anything to note about these three genera.

(EUDELLA =) CERCOPHANA.

Here *E. rufescens* Phil., *E. vulpes* Butl., *E. daphnea* Maass. & Weym., and *Cercophana frauenfeldi* Feld. are all colour aberrations of *E. venusta* (Walk.), while *E. aristoteliae* (Phil.) is the *female* of it.

I have a new species to describe which superficially resembles the Liparid genus *Orgyia* rather than one of the *Saturniidae* :—

Cercophana mirabilis sp. nov.

The most obvious differences which separate this species at a glance from any of the varieties of *E. venusta* (Walk.) are its small size (barely half that of *venusta*), strongly dentated margins to all wings, and absolutely tailless hindwings in both sexes.

MALE.—*Forewings* deep rufous chocolate, a large round white spot situated at apex of cell, beyond which is a transverse bar of darker chocolate.

Hindwings orange yellow, with the outer third reddish chocolate, and a central narrow transverse band of the same colour.

Underside similar, but all the colours and markings more mixed and indistinct.

FEMALE.—*Forewings* reddish grey, with a dull yellow round spot at the apex of the cell, between which and the base of the wing are two indistinct red transverse lines, and beyond the cell again are two broader and more distinct ones.

Hindwings reddish grey, more brown towards the margins, and crossed by two very indistinct transverse lines.

Underside identical.

Expanse: ♂, 1½ inches = 38 mm.; ♀, 2 inches = 51 mm.

Hab. Chili. (In Coll. Standinger.)

The genus therefore is reduced to the following:—

1. *Cercophana cenusta* (Walk.).
 - ab. *rufescens* (Phil.).
 - ab. *calpes* (Butl.).
 - ab. *daphnea* (Maass. & Weym.).
 - ab. *frauenfeldi* Feld.
2. *C. mirabilis* sp. nov.

ACTIAS.

The genus *Tropaea* Hübn. was established after 1816, while *Actias* was set up by Leech in the year 1815. Mr. Kirby keeps them separate, but I cannot find any characters to define them as two separate genera; moreover, Mr. Kirby has placed several subspecies of *Actias selene* (Hübn.) in *Tropaea*, while he places *A. selene* (Hübn.) itself in *Actias*. Therefore I think that all species must be united under the genus *Actias*, which then stands as follows:—

1. *Actias isabellae* (Graells).
2. *A. sinensis* (Walk.).
3. *A. luna* (Linn.).
 - ab. *azteca* Pack.
 - ab. *rossi* Ross.
 - subsp. *dictynna* (Walk.).
4. *A. selene* (Hübn.).
 - subsp. *ningpoana* Feld.
 - ab. *maasseni* (Kirby).
 - subsp. *artemis* (Brem.).
 - ab. *gnoma* (Butl.).
 - ab. *dulcinea* (Butl.).
 - ab. *aliona* (Butl.).

ARGEMA.

A. leto (Doubl.) is the male of *A. moenas* (Doubl.), and was described a year later, so must sink; the genus therefore consists, as follows, of four species:—

1. *Argema mimosae* (Boisd.).
2. *A. mittrei* (Guér.).
3. *A. moenas* (Doubl.).
4. *A. ignescens* Moore.

EUDAEMONIA.

E. brachyura (Drury) at Sierra Leone is very constant, of a buffy rose tint, and about 3 inches to 3½ inches across the forewings. Round Cape Coast Castle, on the other hand, the males very seldom expand more than 2½ inches, have very long tails, and vary in tint from ashy grey to bright yellow and salmon rose. This race may prove distinct enough to be named, but of my five specimens no two are alike, so I

prefer not to describe it at present. I must add that, although taken from the type-specimen, all three figures of *E. argiphontes* Kirby are very different, and all unlike the insect.

1. *Eudaemonia brachyura* (Drury).
2. *E. argiphontes* Kirby.

COPIOPTERYX.

Here *C. phoenix* (Deyr.) is the *female* of *C. semiramis* (Cram.); therefore there are only three species of the genus.

DYSDAEMONIA.

In this genus *D. aristor* (Feld.) is only a dark and rubbed *female* of *D. boreus* (Cram.).

A great amount of variation is shown in *D. tamerlan* Maass. both in size and tint, which latter varies from warm grey to chestnut.

TITAEA AND LOXOLOMIA.

I have nothing to remark except that, if I am not mistaken, no second specimen has ever been recorded of *Loxolomia serpentina* Maass.

ARSENURA.

In this genus *A. hercules* (Walk.) is the *male* of *sylla* (Cram.). I have one new species to describe:—

Arsenura ponderosa sp. nov.

This curious species is quite unlike any other of the genus.

Forewings: ground colour clay colour washed with yellowish buff. Wings crossed obliquely from the apex to near the base of the inner margin by a broad blackish brown line, which is wavy and less conspicuous in the apical half. This line runs parallel with the costa, and not at an angle with it as usual. Within the cell is a half-moon-shaped broad but indistinct line, and a narrower but more irregular one at the apex of cell. The outer half of both wings is crossed by two transverse and parallel broad lines. The outer one bears on the forewings four buff patches, of which the anterior one in front of the upper median nervule is much the largest and almost square. The space between these two lines is narrower than between the outer one and the margin, and is decidedly yellower.

Hindwings similar to forewings, but the outer line is double, gradually merging into one towards the anal angle, where it exhibits a yellow patch.

Head and collar brown, with a white mark between the antennae.

Thorax and abdomen pale buff.

Underside pale buff, the oblique band on forewings wanting, and the two transverse bands much less distinct, the outer one nearer margin, and dissolved into blackish and ruddy spots at the nervules. On the hindwings at the apex of cell is a small brown ring with a central spot.

Expansion: 8.5 inches = 215 mm.

Hab. Chuchuras, East Peru. (In Coll. Dr. Staudinger.)

OXYTENIS.

Here I have two new species, but cannot describe them, as I have not enough material of other species to compare.

PSEUDAPHELIA.

There is nothing to be noted here.

HENIOCHA.

Under this head *H. pyretorum* (Westw.) and *H. cidosa* (Moore) are synonymous, and will stand as *S. pyretorum* Westw., which is a true *Saturnia*, and not a *Heniocha* at all, while *H. terpsichorina* (Westw.) is synonymous with *Usta wallengreni* (Feld.). It is probable that *H. bioculata* Auriv. is the same as *H. marnois* (Rogenh.), but until I can compare *H. marnois* (Rogenh.) with Aurivillius' type, I cannot unite them. I have *male* and *female* of *H. marnois* (Rogenh.) from Lake Victoria Nyauza. *H. flavida* (Butl.) is only a colour aberration of *H. apollonia* (Cram.). I have specimens identical with Mr. Butler's form, but having the ground colour white or cream instead of sulphur yellow. The genus works out as follows:—

1. *Heniocha apollonia* (Cram.)
 ab. *flavida* (Butl.).
2. *H. bioculata* Auriv.
3. *H. marnois* (Rogenh.).
4. *H. dyops* (Maass. & Weym.).
5. *H. terpsichore* (Maass. & Weym.).

SATURNIA.

Grand confusion reigns here. *S. buttoni* (Moore) is only a synonym of *S. stoliczkana* Feld., while *S. schenki* Staud. is only a slight subspecies of it. *Neoris jonasi* (Butl.) is a true *Saturnia*, near *S. boisduvali* Eversm., but certainly not identical with it, nor, as J. H. Leech asserts, is it a variety of it. *S. kunzei* Dew. is not a *Saturnia*, but the third species of the genus *Orthogonioptilum* Karsch. *S. hockingi* Moore is a slightly darker north western form of *S. lindia* Moore. *S. numida* Aust. is an aberration of *S. atlantica* Luc.; I have four specimens intermediate between the two. The following is the synopsis of the genus:—

1. *Saturnia pavonia-major* (Linn.).
2. *S. atlantica* Luc.
 ab. *numida* Aust.
3. *S. pyretorum* Westw.
4. *S. spini* (Den. & Schill).
 subsp. *cephalariae* Christoph.
5. *S. stoliczkana* Feld.
 subsp. *schenki* Staud.
6. *S. boisduvali* Eversm.
7. *S. jonasi* (Butl.)
8. *S. pavonia-minor* (Linn.).
9. *S. anna* Moore.
10. *S. lindia* Moore.
 subsp. *hockingi* Moore.
11. *S. grotei* Moore.
12. *S. bicti* Oberth.
13. *S. medea* Maass.
14. *S. galbina* Clem.

USTA.

Heniocha terpsichorina (Westw.) is the same as *Usta wallengreni* (Feld.). I have a new species to describe :—

***Usta angulata* sp. nov.**

Differs from *U. wallengreni* (Feld.) in two very apparent particulars : firstly, the transverse angulated submarginal band in *U. wallengreni* (Feld.) is convex, follows the outline of the wings, and its angulations are the same size throughout, while in *angulata* the band is quite zigzag and the lower angulations are quite three times the size of the upper ; secondly, the ocelli are much larger, and the fulvous centre is reduced to a narrow ring.

Expanse : $3\frac{1}{2}$ inches = 88 mm.

Hab. Mombasa.

MICRATTACUS.

Micrattacus bulaza Maass. & Weym. is a true *Automeris*, and has nothing to do with the present genus, which only contains two species :—

1. *Micrattacus nanus* Walk.
2. *M. violascens* Maass. & Weym.

HENUCHA.

H. hansali Feld. is not a *Henucha*, but a *Ludia*, so the synopsis of the genus is thus :—

1. *Henucha grimmia* (Geyer).
2. *H. dewitzi* (Maass. & Weym.).

LUDIA.

This genus has four species, as below :—

1. *Ludia delegorguei* (Boisd.).
2. *L. hansali* Feld.
3. *L. obscura* Auriv.
4. *L. dentata* (Hamp.).

BOLOCERA.

Two species only go to form this genus :—

1. *Bolocera smilar* (Westw.).
2. *B. angulata* Auriv.

MICRAGONE.

One species :—

1. *Micragone agathylla* (Westw.).

I have a single specimen of this extremely rare insect.

CYRTAGONE Auriv.

1. *Cyrtagone cana* Auriv.

This may turn out to be the *male* of *Micragone agathylla* (Westw.).

CALOSATURNIA, OXYLOTHRIX, AND PERISOMENA.

None of these genera require any remarks.

EOCHROA.

E. dido Maass. & Weym. is a true *Nudaurelia*, so the solitary species is as follows :—

1. *Eochroa trimeni* Feld.

I give here the list of types in the Tring Museum :—

Coscinocera hercules ab. *butleri* Rothsch.

Attacus lorquini Feld.

„ *crameri* Feld.

„ *dohertyi* Rothsch.

„ *aurantiaca* Rothsch.

„ *satyrus* Feld.

„ *hofferi* Feld.

Philosamia walkeri (Feld.).

Banua tricolor Rothsch.

Copaxa plenkeri Feld. = *C. lavendera* (Westw.).

„ *multijenestrata rufotincta* Rothsch.

„ *cineracea* Rothsch.

„ *trimacula* Rothsch.

Thyella zambesia Feld. = *Nudaurelia zambesina* (Walk.).

Nudaurelia aurantiaca Rothsch.

„ *felderi* Rothsch.

„ *arata* ab. *jusea* Rothsch.

„ *wahlbergi flavescens* Rothsch.

„ *menippe fumosa* Rothsch.

Antheraea rumphi Feld. = *A. paphia* (Linn.).

„ *semperi* Feld.

Bathyphlebia aglia Feld.

Gynanisa westwoodi Rothsch.

Ceranchia mollis Butl.

Cirina cana Feld. = *C. forda* (Westw.).

Dysdaemonia aristor (Feld.) = *D. boreas* (Cram.).

Arsenura batesi (Feld.).

Usta wallengreni (Feld.).

„ *angulata* Rothsch.

Ludia hansali Feld.

Eochroa trimeni Feld.